

Approval Sheet and Signatures

ACADEMIC PROGRAM REVIEW Fairmont State Board of Governors

Program with Special Accreditation Program without Special Accreditation

Date Submitted December 15, 2023

Degree Program Mathematics Bachelor of Science

INSTITUTIONAL RECOMMENDATION Approved by the Board of Governors (§ 5.2.8)

The institution is obligated to recommend continuance or discontinuance of a program and to provide a brief rationale for its recommendation:

- 1. Continuation of the program at the current level of activity;
- 2. Continuation of program with corrective action (for example, reducing the range of optional tracks or merging programs);
- 3. Identification of the program for further development (for example, providing additional institutional commitment);
- 4. Development of a cooperative program with another institution, or sharing courses, facilities, faculty, and the like;
- 5. Discontinuation of the Program

Rationale for Recommendation:

Ademine Terese Joseph Riefen
Signature of person preparing report:

12/15/23
Date

M. Hossain
Signature of Chair

12/15/23
Date

Stewart Paul
Signature of Dean

12/15/23
Date

Wanda Phillips
Signature of Provost and Vice President for Academic Affairs:

6-13-24
Date

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Signature of President:

6/13/24
Date

[Signature]
Signature of Chair, Board of Governors:

6-13-24
Date

Executive Summary for Program Review

Degree Program:	Mathematics – Bachelor of Science Degree Mathematics Education -- Bachelor of Arts Degree (5-Adult) Specialization -- General Mathematics through Algebra I (grades 5-9) Specialization -- Master of Arts in Teaching Degree -MAT (5-Adult) Minors -- Mathematics -- Data Science
College or School/Department:	College of Science and Technology, Computer Science and Math
Chair/Program Coordinator	Dr. Mahmood Hossain
External Reviewer:	Dr. David Kennedy
Reviewer Email:	dikenn@ship.edu

Synopses of significant findings, including findings of external reviewer(s) information

The Mathematics program demonstrates a successful approach to sustainability, viability, and assessment. From 2018-2023, the program produced 40 Mathematics B.S. graduates. This is the second highest total among WV public institutions with only the nearby land-grant university having more math graduates. We are also second in number of math graduates per degrees awarded, only trailing a university which is no longer offering a Mathematics B.S. degree. For more detailed information refer to [Similar Programs in WV](#)

Our program design is supported by the Guide to Majors in the Mathematical Science from MAA-CUPM 2015 (Mathematical Association of America Committee on the Undergraduate Program in Mathematics) and the Conference Board of Mathematical Sciences Report MET II (Mathematical Education of Teachers Part II, 2012). For more detailed information refer to [APPENDIX G: Conference Board of Mathematical Sciences](#)

In 2017, the Mathematics Education (5-Adult) Program received the designation of *National Recognition* from NCTM after a complete program review. The Mathematics 5-9 teaching endorsement program and the Master of Arts in Teaching (MAT) program in Mathematics (5-Adult) received the designation of *National Recognition*. All three programs are fully accredited by CAEP until Spring 2026.

Dr. David Kennedy from the Mathematics Program at Shippensburg University of Pennsylvania served as our external reviewer. He consistently lauded the strength of our graduation numbers in light of university enrollment, other state institutions, and national trends. He also congratulated us on attracting students to major/minor in mathematics. Much of our recruitment occurs in the classroom because we graduate more math graduates than enter the program as Freshman. He indicated that our discussions examining and updating the math curriculum should continue. The Mathematics Program goal of aligning courses and curriculum with the Mathematical Association of America (MAA) national recommendations is very appropriate.

He stated that our assessment system is logical and has garnered the attention of other institutions. "The course revisions that have resulted from your assessment findings are an

indicator that authentic assessment is taking place.” Faculty are making “appropriate, creative contributions” to the students of Fairmont State including undergraduate research.

For complete report refer to [APPENDIX H: External Reviewer Report](#)

Plans for program improvement, including timeline

- **Recruitment and Retention:** We plan to pursue more extensive recruitment efforts by working with University Relations & Marketing. We plan to create opportunities to build community among math majors and faculty.
- **Course Offerings and Rotation:** Math faculty will re-evaluate the direction of the Mathematics program and discuss the possibility of offering concentrations for our majors. Additional program offerings may be pursued. The current version of the four-year course rotation schedule is out of date. We need to update and publicize the schedule so that students will know when courses will be offered in advance.
- **Undergraduate Research:** Promote undergraduate research to prepare the B.S. mathematics major for graduate school and employment opportunities. Aim to average 1.2 projects per year.

What plans for improvement are there for the courses with High DFW rates?

1400 – (Success rate – 62%)

In accordance with guidance from the WV HEPC, MATH 1400 has not been offered since 2019.

1410 – (Success rate - 59%)

A new 4-credit enhanced version of 1410 was created in Spring 2023. More than one semester of data is required to judge success or to make changes regarding the course.

1430 – (Success rate - 67%)

Final exam study session will continue to be offered and there are plans to begin a study session at the LEAD Center prior to each regular test throughout the semester.

1561 – (Success rate - 67%)

Continue additional assignments and scaffolding to help students reach the level of abstract thinking required of Mathematics majors and Computer Science majors. Assessment data will be closely monitored.

For more detailed information refer to [Analysis of High DFW](#)

Five-year trend data on graduates and majors enrolled

			HEPC Series 10		
AY	*Enrollment	**Degree Awarded	Productivity Standards Programs are required to meet at least one of the indicators listed below.		
2022-2023	18	6			
2021-2022	23	11			
2020-2021	19	9			
2019-2020	18	8	Average of Five Most Recent Years		
2018-2019	17	6	Degree Level	*Enrollment	**Degree Awarded
5-YR AVG	19	8	Baccalaureate	12.5	5
			Masters	NA	NA
* Official fall end of term headcount					
** IPEDS Graduation data (July 1 - June 30)					

For more detailed information refer to [Program Graduates](#)

Identification of weaknesses or deficiencies from the previous review and describe how these have been addressed.

The primary deficiency cited in the 2013-2018 review was that the Taskstream goal and outcome measures were missing. Mathematics B.S. was passed with corrective action and assessment data was to be reported within one year. The Fairmont State Provost determined that the requested assessment information was available in Taskstream at the time of the review and hence no corrective action was needed.

For more detailed information refer to [Previous Program Review Results \(2013-2018\)](#)

Summary of assessment model and how results are used for program improvement

The Mathematics program utilizes a departmental continuous improvement plan to meet institutional assessment requirements.

Continuous improvement occurs at three levels. These levels include:

1. Assessment of Course Outcomes
2. Assessment of Program Outcomes
3. Program Modifications as determined necessary by the assessment of outcomes

The general process follows: *For more detailed information refer to [Assessment Requirements](#)*

- A curriculum map has been developed to organize program assessment.
- Every program course has clearly defined outcomes and assessment points to be evaluated. Specific courses and outcomes were chosen as the assessment points for each program outcome.
- Course Outcomes are linked to the corresponding Program Outcomes in Taskstream.
- Course Outcomes are assessed using various tools such as course exams, assignments, quizzes, projects, labs, etc.
- A satisfactory benchmark for competency was established for each program outcome.
- If competency is not demonstrated, an improvement plan is established for that assessment point which may include changes to content or course delivery.
- The continuous improvement plans are approved by a collaborative agreement of the program faculty.

Data on student placement (for example, number of students employed in positions related to the field of study or pursuing advanced degrees)

Through graduate surveys and other contacts, we have information for 65% of the 2018-2023 graduates. Approximately 90% of those graduates are either successfully employed in the field of mathematics/mathematics education or attending graduate school. In addition, about 77% of those graduates are employed or are attending graduate school in West Virginia, including 16 in north central West Virginia.

In Mathematics education, 6 of 8 Math (5-Adult) are employed in North Central West Virginia. For Math 5-9 specializations, 6 are teaching in schools and the other two are employed outside of education. In addition, the Mathematics Education programs provided seven Clinical Teachers of Record to the public schools from 2018-2023.

For more detailed information refer to [Graduate Placement Data and Success of Graduates](#)

V. FINANCIAL HEALTH

The **financial health** of a program refers to the cost and revenue portion of the program. This analysis reveals the extent to which the program is contributing to the institution's financial health and if additional resources are necessary to sustain the program.

The metrics below represent required program financial data to be collected in reviewing the financial health of the program [IEO supplied for the report].

Category	Metric	2020	2021	2022	2023	Change
Revenue	General Tuition and Fee Revenue	\$2,285,311	\$1,866,307	\$1,694,469	\$1,796,359	-21%
	Program Fee Revenue	\$7,458	\$7,275	\$4,450	\$3,750	-50%
	Course Fee Revenue	\$128,535	\$120,757	\$118,580	\$125,049	-3%
Expenses	Direct Costs	\$87,931	\$85,241	\$94,963	\$101,596	16%
	Indirect Departmental Costs	\$710,471	\$715,600	\$713,417	\$798,580	12%
	Indirect College Costs	\$200,857	\$164,991	\$151,828	\$174,799	-13%
	Indirect Institutional Costs	\$570,513	\$678,710	\$983,258	\$516,623	-9%
Net Position without Indirect Institutional Costs		\$1,422,044	\$1,028,508	\$857,291	\$850,183	-40%
Net Position Per Credit Hour Delivered with Indirect Institutional Costs		\$106.26	\$52.66	\$(21.27)	\$55.10	-48%